Grafana at MWT2 and OSG Connect

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Some background

- Used Cacti, Ganglia, and other tools in the past.

- Ganglia felt too inflexible, Cacti too convoluted

- Heard about Graphite at a Linux User Group presentation, started experimenting in summer 2014

- Started using Grafana around January 2015, very pleased with it thus far.

Graphite

- http://graphite.wikidot.com/

- Real-time graphing for time series data

- Three main components:

  - Whisper - Data format, replacement for RRD

  - Carbon - Listener daemon

  - Front-end - Web interface

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The Graphite Protocol

- Dead simple.

- Open a socket, fire off metrics in the form of:
  - `path.to.metric <value> <timestamp>`

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Sample script

```bash
#!/bin/bash

metric="htcondor.running"
value=$(condor_q | grep R | wc -l)
timestamp=$(date +%s)

echo "$metric $value $timestamp" | nc \
 graphite.yourdomain.edu 2003
```

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Enter Grafana

- Graphite web interface is powerful but somewhat lacking

- Fortunately it can export JSON instead of PNGs

- Grafana is another tool that sits atop of Graphite

  - provides much nicer plotting tools, dashboarding, etc

- All HTML5 / Javascript goodness.

  - Excellent options for embedding graphs elsewhere.

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Another handy tool - CollectD

- Graphite is almost too simple sometimes.

- We're starting to heavily invest in CollectD

  - Generic system statistics collector

  - Many, many plugins already available, including Graphite

 - Straight-forward to write your own collectors.
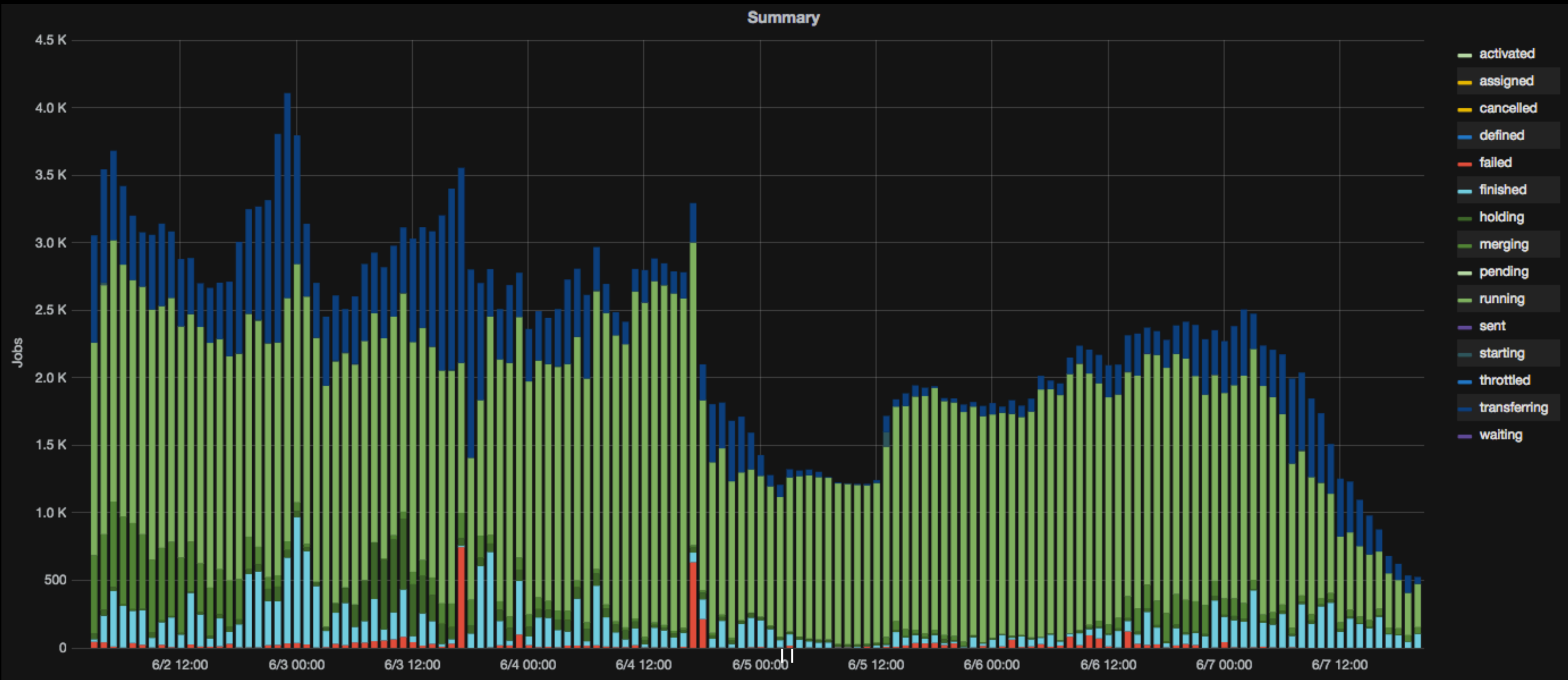
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A Gallery of Grafana Graphs

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ATLAS batch queue data

- Scrapes ATLAS Production & Distributed Analysis (PanDA) system via JSON API

- e.g., http://bigpanda.cern.ch/jobs/?jobtype=analysis&display_limit=100&computingelement=MWT2_SL6

- Once an hour, as to not overload their webserver

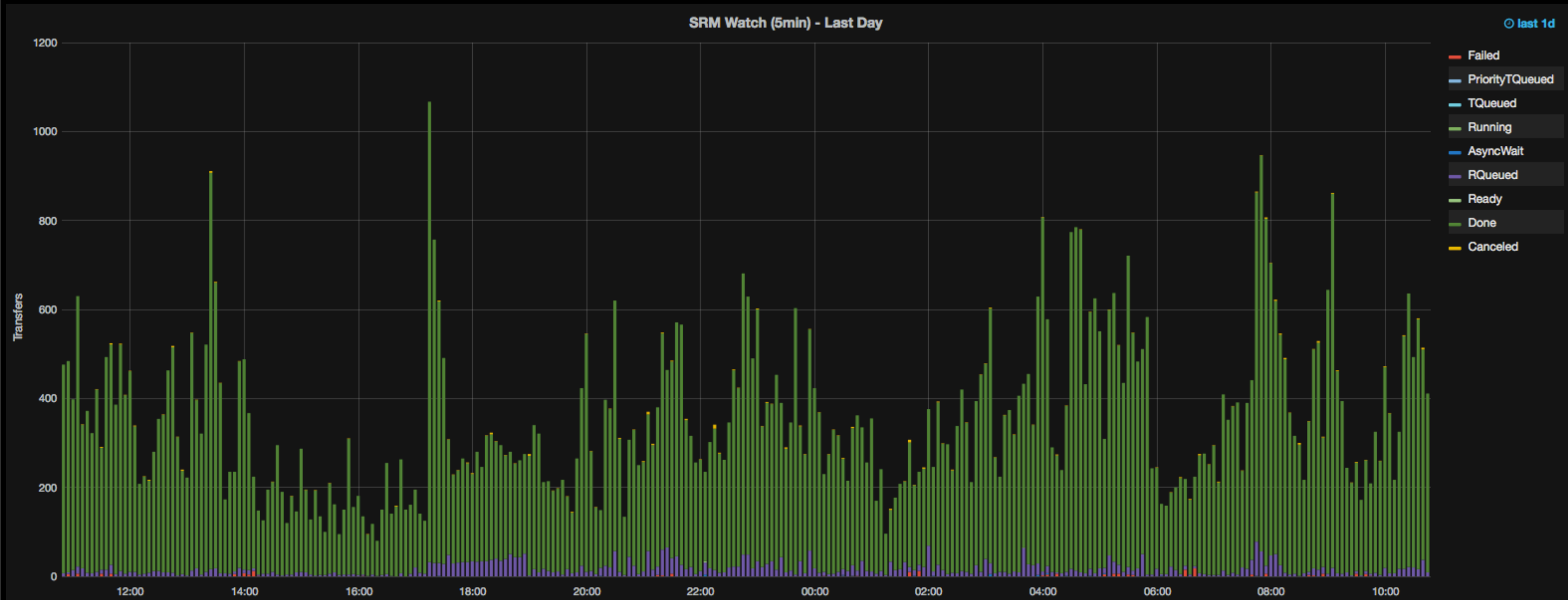- Breakdowns by sub-site (IU, UC, UIUC)

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ATLAS analysis queue
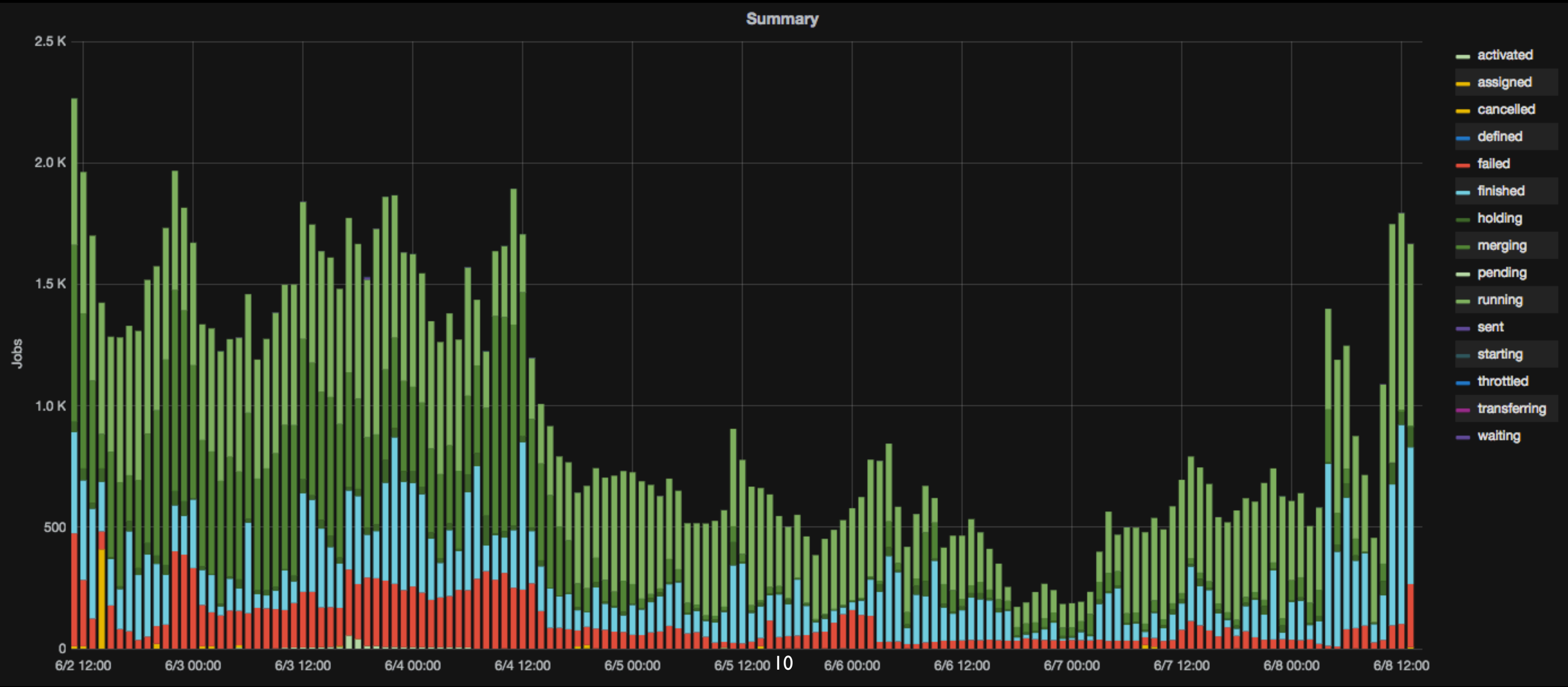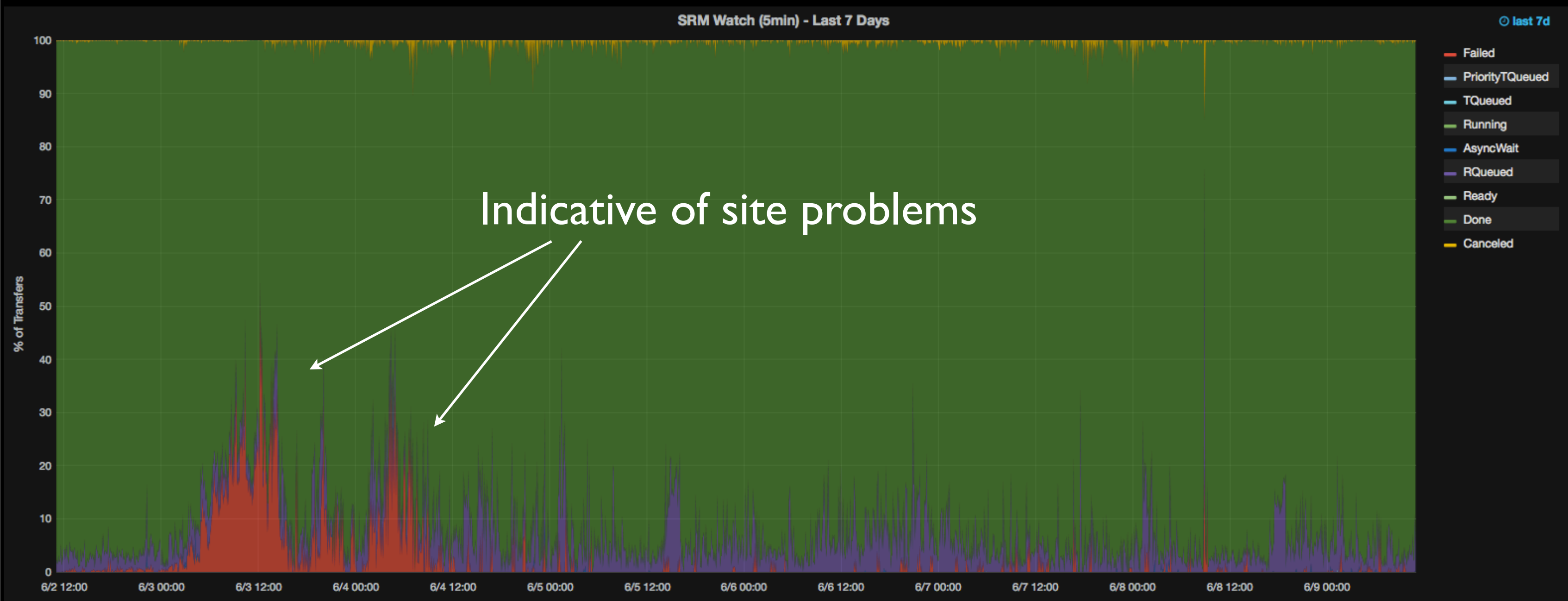
ATLAS production queue

dCache SRM

- Monitors SRM/GridFTP transfers at MWT2

- Scraping dCache's PostgreSQL database

- Runs every 5 min.

- SRMWatch now deprecated -- very suitable replacement.
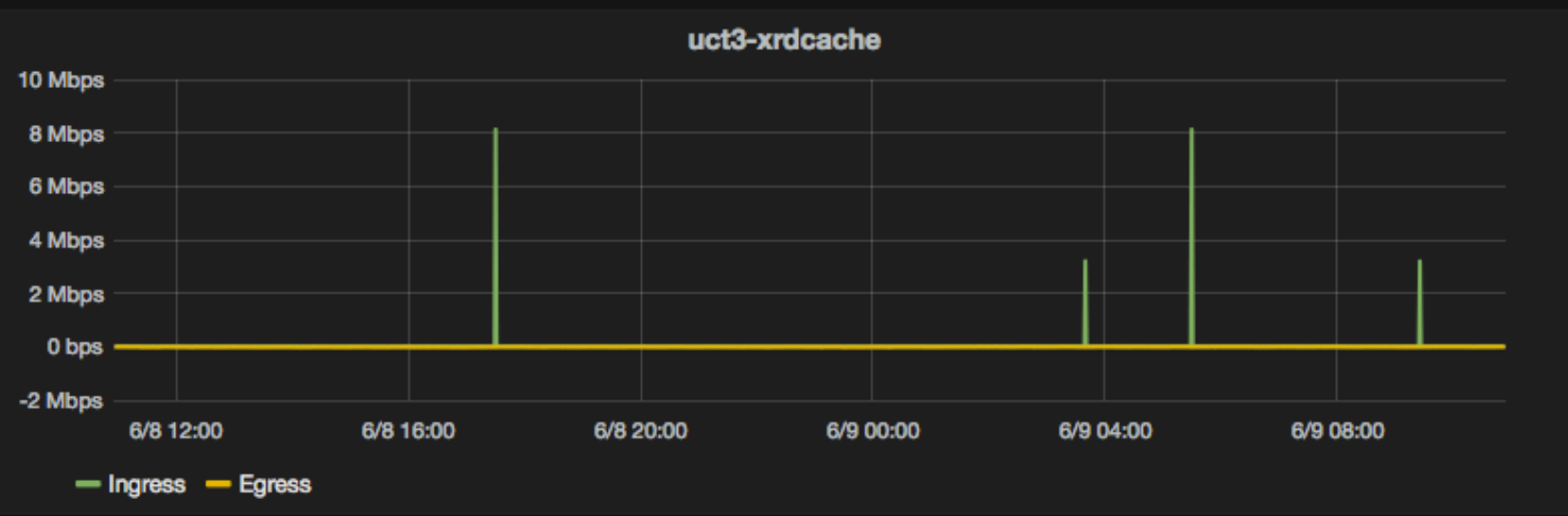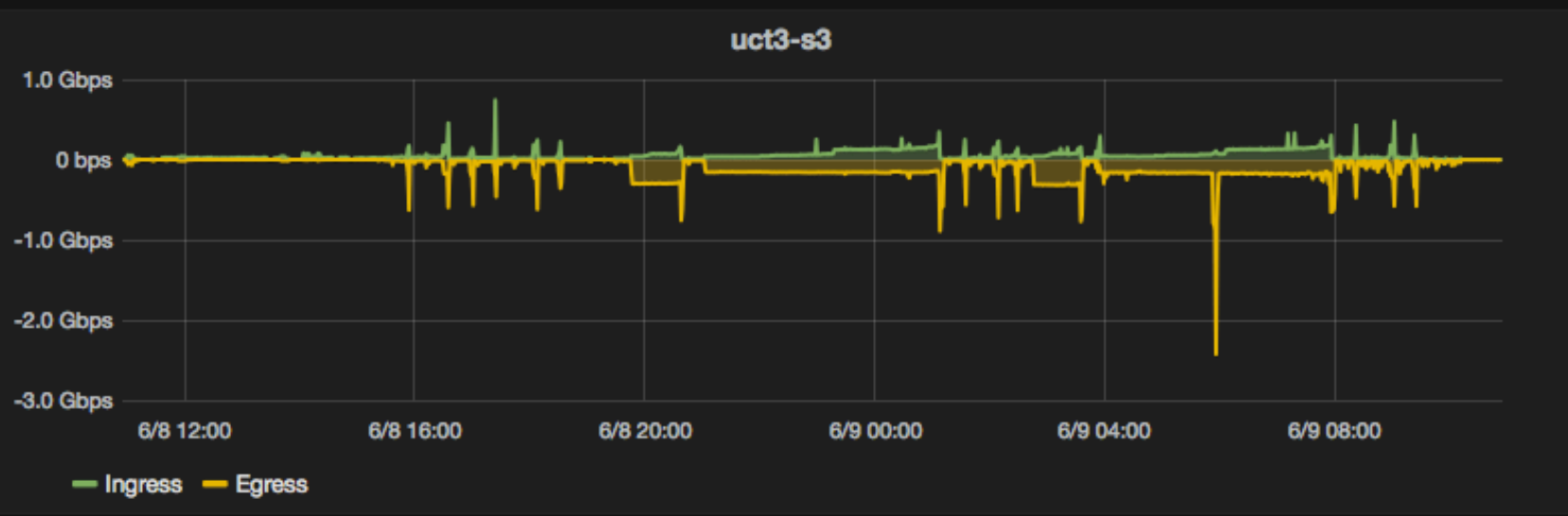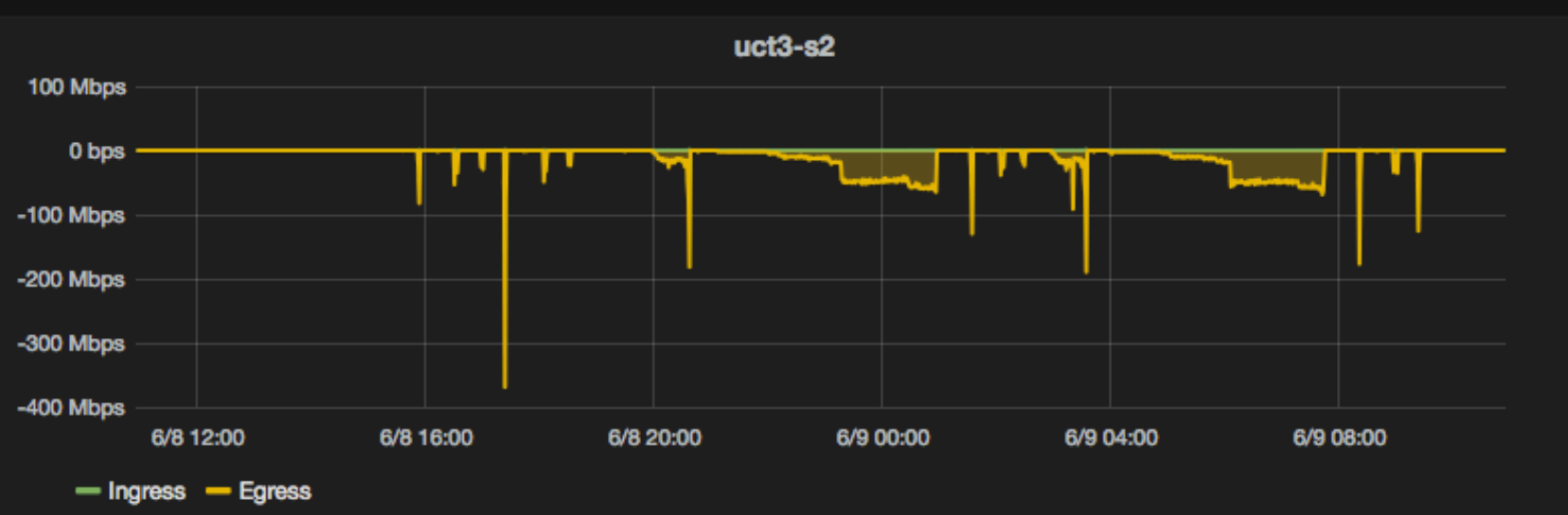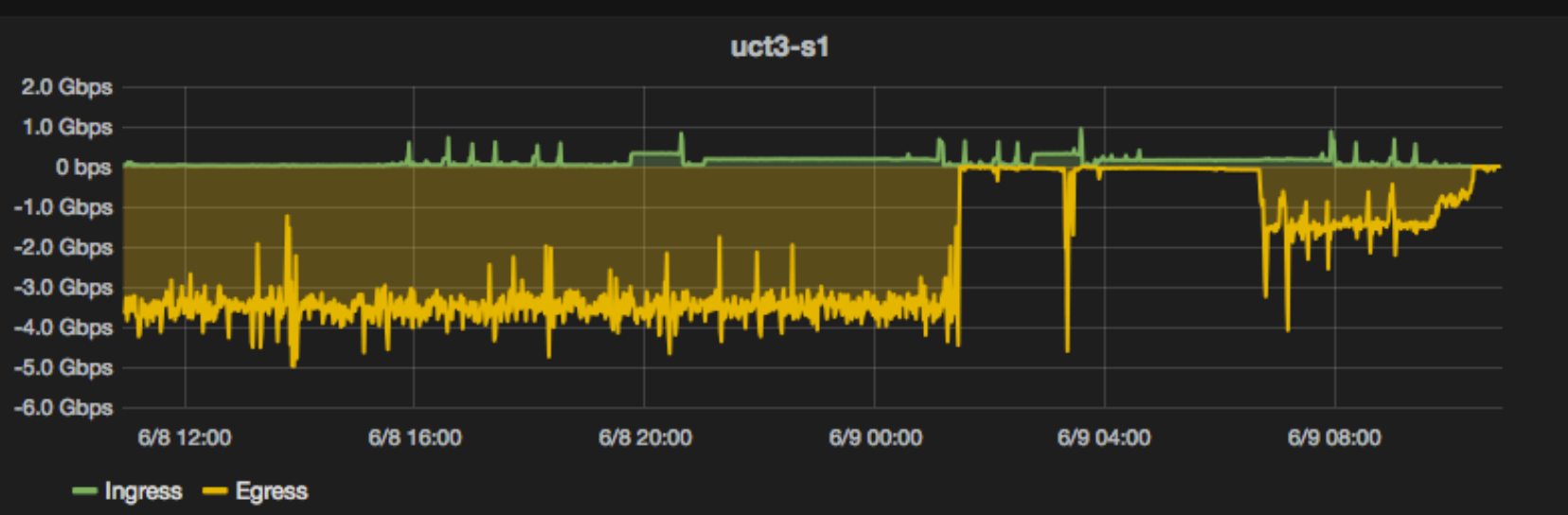
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dCache SRM

dCache SRM

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UChicago Tier 3 XRootD

- Scraping network statistics of XRootD servers via CollectD

- Also have an XRootD cache server for caching data from the ATLAS data federation (FAX).

  - Looking at cache occupancy, cached file ages, percentage of file cached

UChicago Tier 3 XRootD

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UChicago Network Statistics

- Using CollectD's SNMP plugin to gather data from our switches

- Switches are tricky.

  - Interface counters measure octets and can roll-over to 0
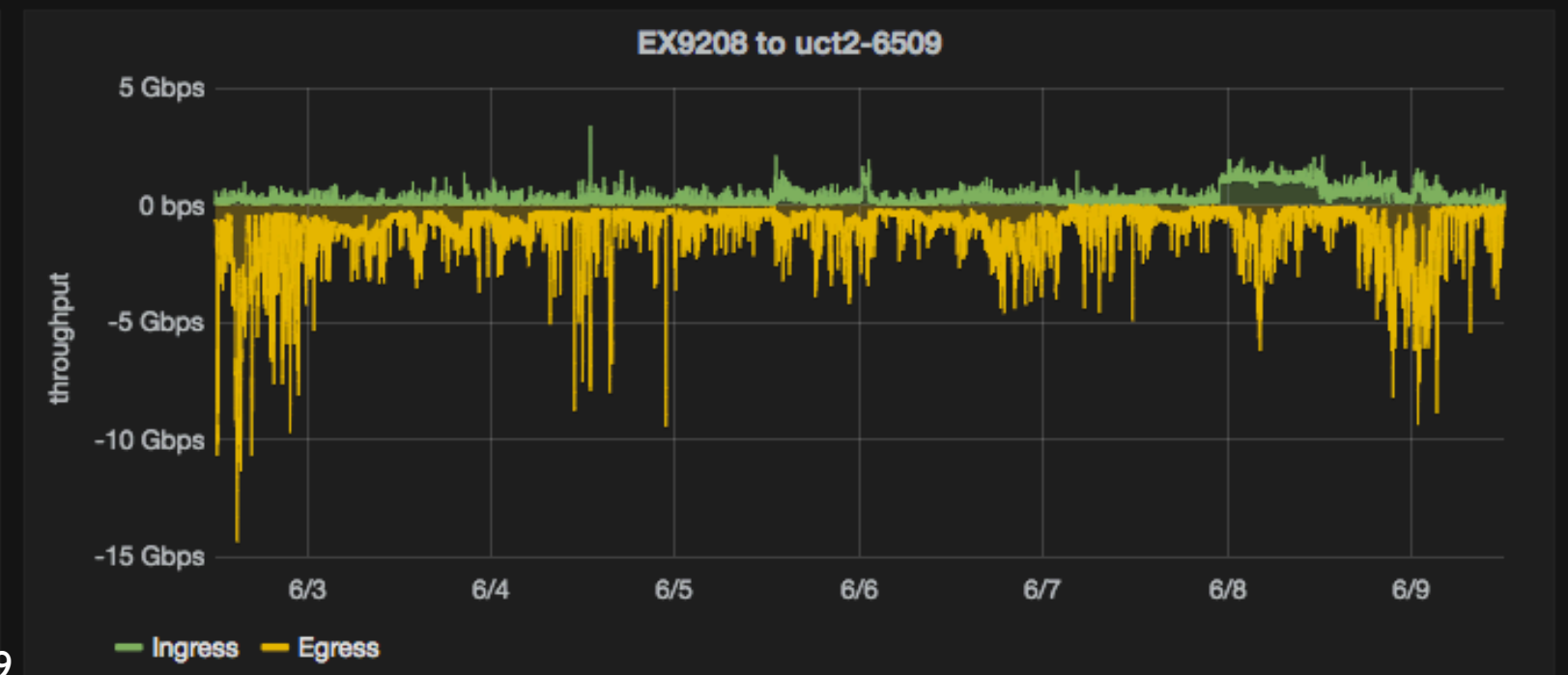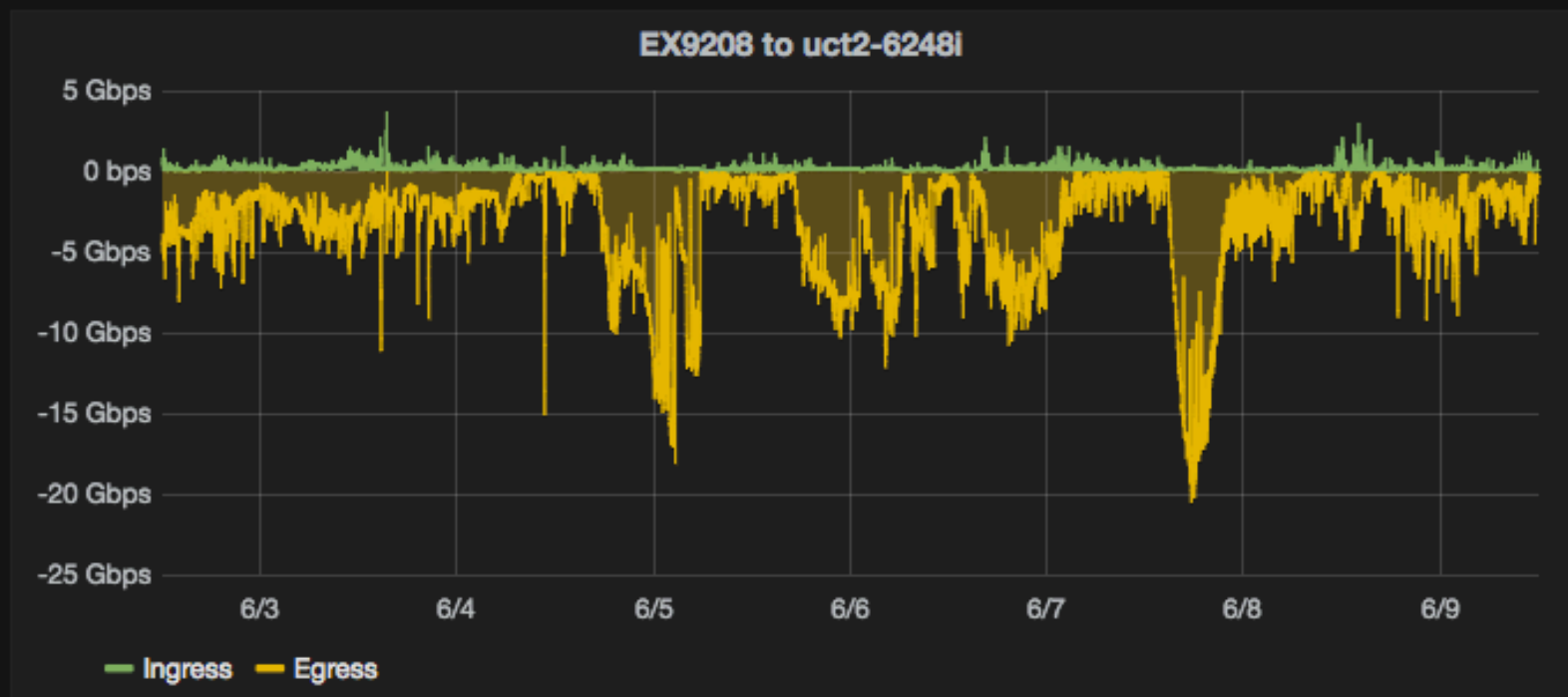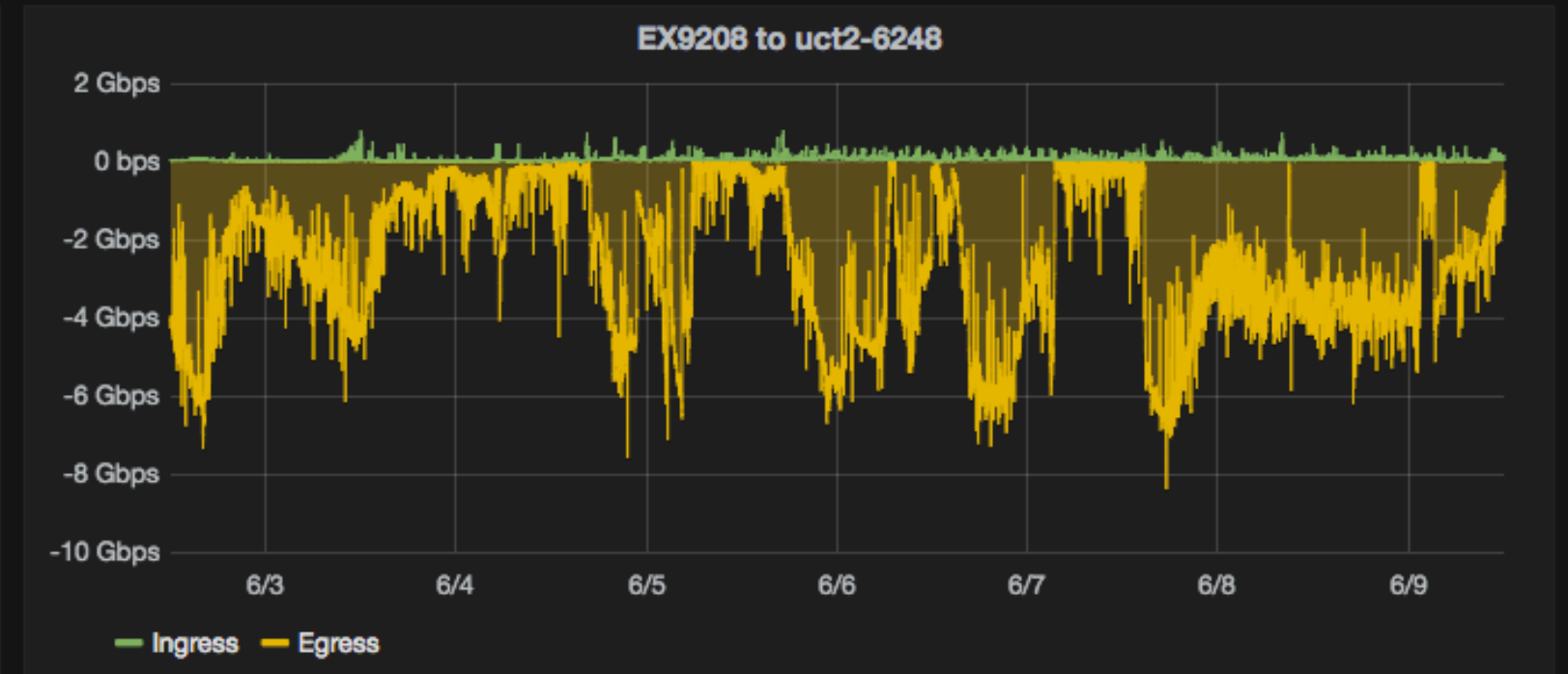
  - nonNegativeDerivative and scaling functions are needed

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UChicago Network Statistics

Juniper EX9208 to SciDMZ

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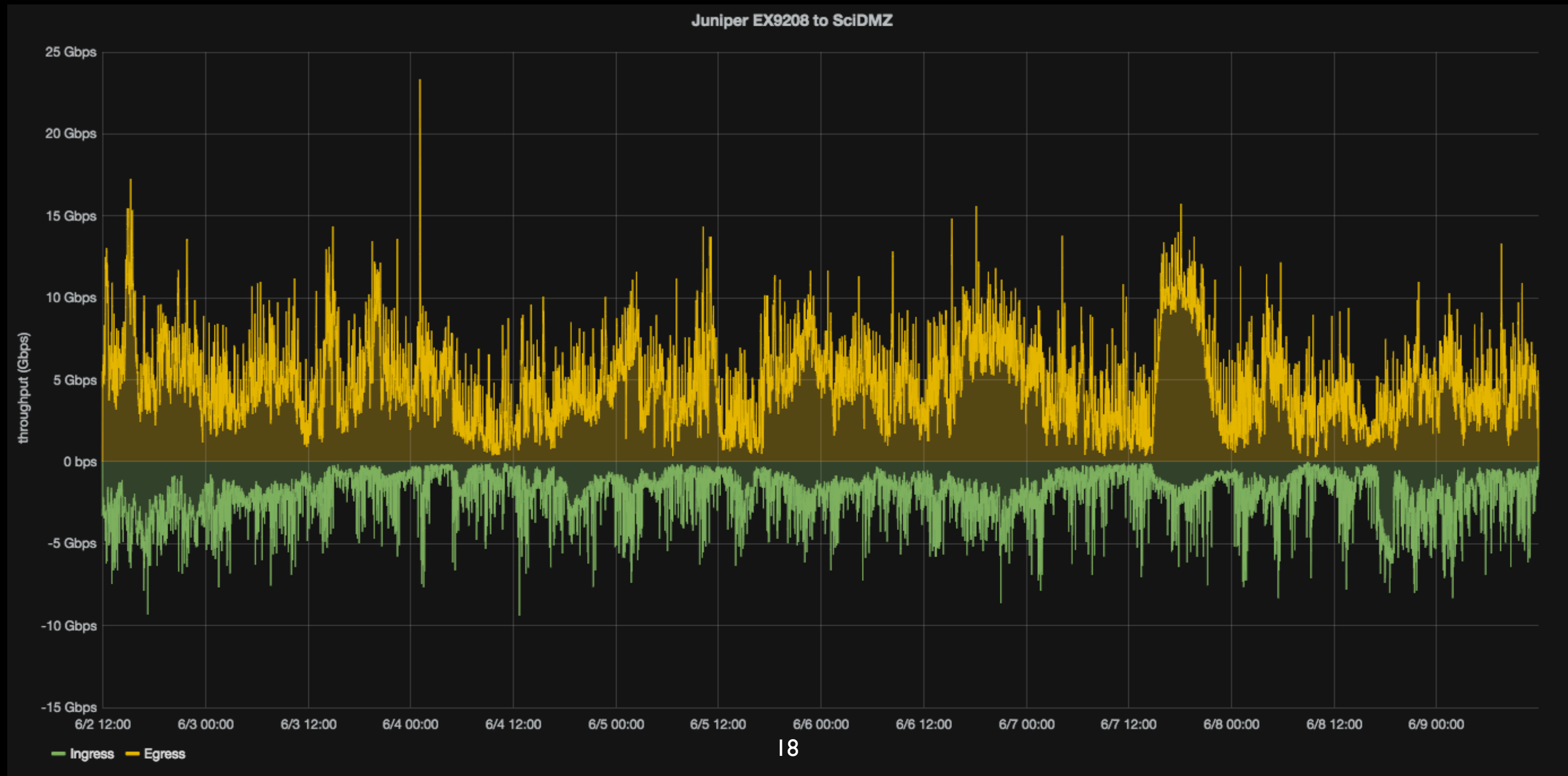
UChicago Network Statistics
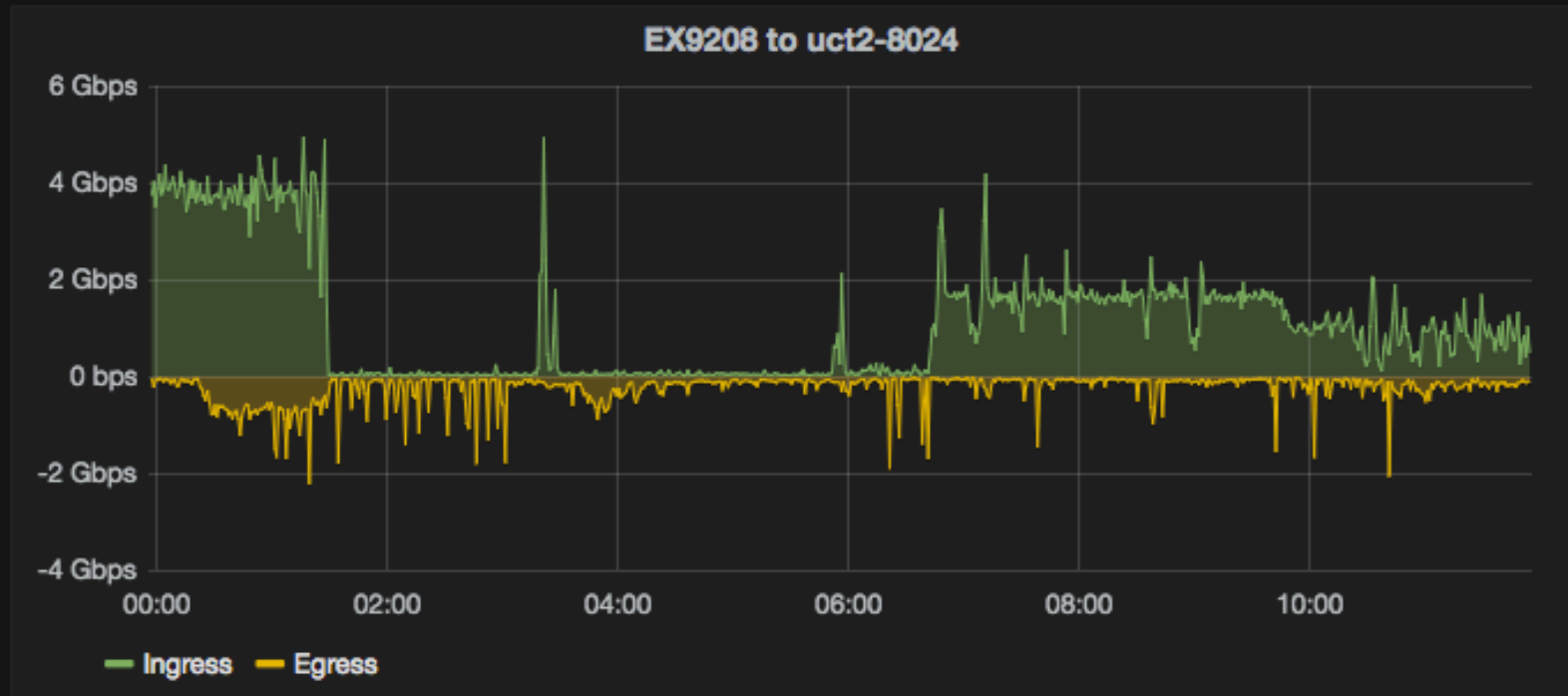
HTCondor Statistics

- We monitor HTCondor for both MWT2 and for our OSG Connect service.

- For MWT2, interested in job efficiencies, etc.

- For OSG Connect, interested in behavior of the submit box, etc.

HTCondor Statistics

MWT2 Efficiency by Pool

	min	max	current
Illinois	56%	89%	89%
Indiana	72%	88%	79%
UChicago	87%	94%	93%
UChicago NAT	95%	96%	95%

HTCondor Statistics

Jobs Running by User

	current
bxie	1
dbala	99
dgc	3
dschultz	16
jenkins	1
jpessin1	423
jtqv84	1
mmw88	2
nathankaib	204
nguyentrungh	659
olsona	1
reevesp	224
yadunand	1

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HTCondor Statistics

OSG Connect - Last 7 Days (30min avg)

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Future directions

- Graphite has a mechanism for tagging events

  - Basically a vertical bar on the graph, viewable in Grafana

  - e.g., "SRM errors increased due to switch problems"

- Grafana's templated dashboards to create per-user or per-site metrics

Finally..

- Feel free to explore our Grafana instance:

  - http://grafana.mwt2.org:3000/

- Code: https://github.com/DHTC-Tools/grafana-collectors

  - (n.b., this is highly disorganized at the moment.)

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Thanks

- Questions?